8.2 BIOLOGICAL RESOURCES

This section describes biological resources in the vicinity of the Pico Power Project (PPP), and the potential effects of the project on them. Section 8.2.1 discusses the affected environment, including a regional overview of vegetation, sensitive plant communities, wetlands, wildlife, economically important wildlife species, and special status species. Section 8.2.1 also discusses methods and results of biological field surveys at the PPP, and along each of the linear facilities. Section 8.2.2 discusses the effects that construction and subsequent operation of the new facilities may have on special status plant and animal species and sensitive habitats. Section 8.2.3 evaluates any potential cumulative impacts to biological resources in the project vicinity and Section 8.2.4 addresses proposed mitigation measures. Section 8.2.5 presents applicable laws, ordinances, regulations and standards (LORS). Section 8.2.6 presents agency contacts and Section 8.2.7 presents permit requirements and schedules. Section 8.2.8 contains references.

8.2.1 Affected Environment

The Santa Clara Valley and surrounding foothills are dominated by urban environments, oak woodland, annual grassland, and native bunchgrass prairie on serpentine soils. Community types in the project study area include urban environments with horticultural trees and shrubs, an urban riparian corridor, and open space/ruderal areas.

8.2.1.1 Regional Biological Resources

The Santa Clara Valley historically contained various habitats including riparian woodland, willow riparian woodland, sycamore alluvial woodland, emergent and vernal wetlands, and annual and perennial grasslands. Oak woodland, coastal sage scrub, and serpentine bunchgrass dominated the surrounding hills. Current land use is dominated by urban commercial/industrial development and urban residential development.

Regional biological resource areas in the vicinity (Figure 8.2-1) include the San Francisco Bay National Wildlife Refuge 3.6 miles to the north, the Sunnyvale Baylands Park 3.3 miles to the northwest, Alum Rock Park 7.0 miles to the east, Ed Levin County Park 7.0 miles to the northeast, and Calaveras Reservoir 9.1 miles to the northeast. In addition, the U.S. Fish and Wildlife Service (USFWS) has designated approximately 24,000 acres of serpentine grassland as critical habitat for the Bay checkerspot butterfly (*Euphydryas editha bayensis*), with 15 units within San Mateo and Santa Clara Counties. The closest critical habitat units to the project area are the Communication Hill critical habitat unit 7.1 miles to the southeast of the project site, and the Silver Creek critical habitat unit 11.5 miles southeast of the project site.

Elevation for all the project facilities ranges between 3.7 and 10.5 meters (12 feet and 34 feet). The climate is temperate, and is influenced by the regional topography and proximity to the Pacific Ocean. The climate is fairly constant and predictable, with a bimodal seasonal pattern with respect to rainfall and temperature. Summers are warm and dry, with the exception of morning overcast due to a marine inversion layer. Winters are wet and cool, with rain occurring between October and March.

8.2.1.2 Vegetation

Biological habitats within the project area consist primarily of urban landscapes with horticultural trees and shrubs, and open lots with ruderal vegetation. The Guadalupe River urban riparian corridor approximately 0.7 miles east of the proposed power plant site. Urban riparian corridors can be important

habitat remnants, providing open space and wildlife benefits. The proposed project area is comprised of bare ground, ruderal vegetation, and ornamental trees.

8.2.1.3 Sensitive Plant Communities

There are no sensitive plant communities found within a one-mile radius of the project area. Regional sensitive plant communities include serpentine bunchgrass communities found in the surrounding hills to the south, and northern coastal salt marsh found in the San Francisco Bay National Wildlife Refuge to the north.

8.2.1.4 Wetlands and Waters of the U.S.

There are no wetlands or waters of the U.S. on the project site or associated facilities. There is a narrow ditch in the center of a line of ornamental trees on the project site (see Section 8.2.1.10). However, this area is a limited water collection sump used by the City of Santa Clara to clean street sweeping machines, rather than a creek or natural drainage, and the water in the ditch is due to vehicle cleaning. In addition, there is a large patch of perennial pepperweed (*Lepidium latifolium*) in a ruderal field on the east side of the project. However, this area does not meet the soils, vegetation, and hydrology criteria of a wetland.

8.2.1.5 Wildlife

Wildlife potentially occurring on or within one mile of the project site consists primarily of species common to developed, urban areas, such as the common crow and rock dove. Habitat for a wider diversity of wildlife species exists approximately 0.7 miles east of the project site, along the urban riparian habitat of the Guadalupe River and adjacent fields. Species potentially occurring in this area include shorebird and waterfowl species, burrowing owl, and passerine songbirds. Species occupying riparian habitat will not be affected by project construction or operation.

8.2.1.6 Economically Important Wildlife Species

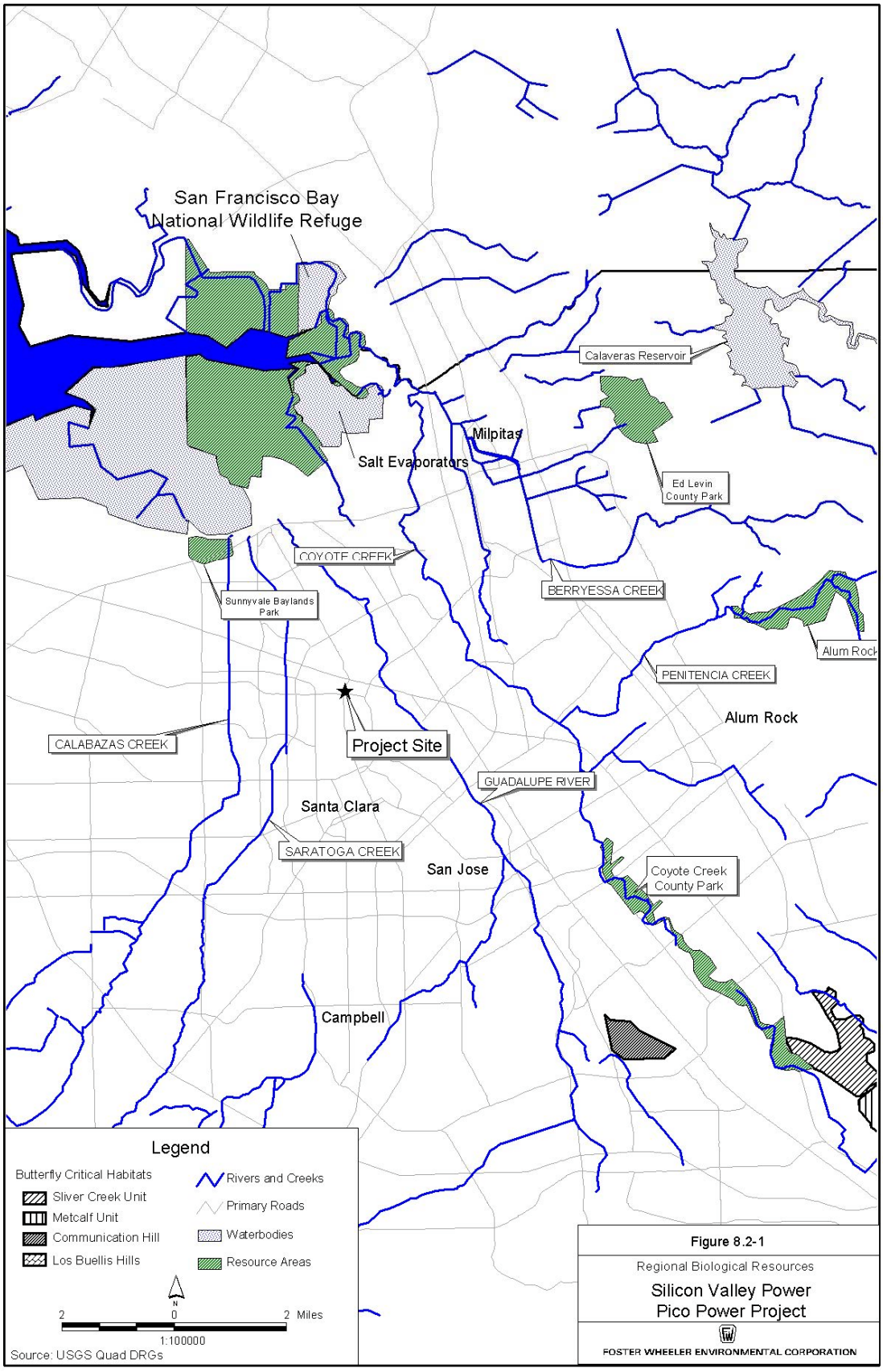
There are no economically important terrestrial wildlife species within the impact area of the proposed project.

8.2.1.7 Special Environmental Areas in Project Vicinity

There are no special environmental areas within a one-mile radius of the project site.

8.2.1.8 Special Status Species

The designation of special status includes all state- and federally-listed species under the state and federal Endangered Species Acts (ESAs); species proposed for those listings; federal Species of Concern (SC); California Species of Special Concern (CSC); California Fully Protected species under the Fish and Game Code; and plant species designated as Rare, Threatened, or Endangered by the California Native Plant Society (CNPS). Species of concern include those that could be listed in the future and those currently protected under other laws (e.g., the Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act).


San Francisco Bay
National Wildlife Refuge
Calaveras Reservoir
Milpitas
Salt Evaporators
Ed Levin
County Park
COYOTE CREEK
Sunnyvale Baylands
Park
BERRYESSA CREEK
Alum Rock
PENITENCIA CREEK
Alum Rock
Project Site
CALABAZAS CREEK
GUADALUPE RIVER
Santa Clara
SARATOGA CREEK
San Jose
Coyote Creek
County Park
Campbell
Legend
Butterfly Critical Habitats
Sliver Creek Unit
Metcalf Unit
Communication Hill
Los Buellis Hills
Rivers and Creeks
Primary Roads
Waterbodies
Resource Areas
N
2
0
2 Miles
1:100000
Source: USGS Quad DRGs
Figure 8.2-1
Regional Biological Resources
Silicon Valley Power
Pico Power Project
FOSTER WHEELER ENVIRONMENTAL CORPORATION

Standard references used for the biology and taxonomy of plants and plant communities included California Department of Fish and Game (1999); Hickman (1993); Barbour and Major (1977); Holland (1986); Sawyer and Keeler-Wolf (1995); and Tibor (2001). Standard references used for the biology and taxonomy of wildlife included Ehrlich, Dobkin and Wheye (1988); Peterson (1990); Udvardy (1977); Stebbins (1985); and Zeiner (1988; 1990 a, b).

A computerized search of the California Natural Diversity Data Base (CNDDB/RareFind report, April 2002) was conducted for the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir USGS topographic quadrangles (the "study area"). This search was conducted to determine if there were any occurrences of state- or federally-listed species recorded within or near the project study area and surrounding serpentine ridges. Known locations of special status species, based on the database search, are mapped on Figure 8.2-2. Appendix 8.2-A contains the CNDDB report. In addition to the CNDDB/RareFind report, a letter was sent to the U.S. Fish and Wildlife Service (USFWS), Sacramento Field Office, requesting file data on special status species that could occur in the project vicinity. The USFWS response is presented in Appendix 8.2-B.

In addition to the literature sources mentioned above, site-specific information was gathered during field surveys conducted in the spring of 2002 (see Section 8.2.1.10).

Special Status Plants

Table 8.2-1 lists the special status plant species in the vicinity of the project components, based on CNDDB/RareFind and USFWS data. Brief descriptions of special status plant species that may occur in the project area are presented below. Habitat for these species occurs near the proposed project site.

Tiburon Indian paintbrush (*Castilleja affinis* ssp. *neglecta*)

HABITAT AND BIOLOGY: Perennial herbaceous flower growing to 60 cm tall. Found in rocky serpentine areas of valley and foothill grasslands at elevations between 75 and 400 m. Threats include cattle grazing, gravel mining, and development (Hickman 1993; Tibor 2001).
BLOOMING: April-June
RANGE: Populations known from only seven occurrences in Napa, Marin, and Santa Clara counties. Some of the populations are protected at Ring Mountain Preserve in Marin County. Occurrences in Santa Clara County are from Kirby Canyon (USFWS 1998).
CNDDB/RAREFIND RECORDS: There are no CNDDB records for Tiburon indian paintbrush in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles.
HABITAT PRESENT IN PROJECT AREA? Habitat for Tiburon indian paintbrush exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

Coyote ceanothus (*Ceanothus ferrisae*)

HABITAT AND BIOLOGY: Evergreen shrub growing to 2 m tall. Found on dry slopes of chaparral and valley and foothill grasslands associated with serpentine soils at elevations less than 300 m. Threatened by cattle grazing, dumping, fire management, and development, including expansion of Anderson Reservoir Spillway (Hickman 1993; Tibor 2001).
BLOOMING: January-March
RANGE: Known from four occurrences in three locations in Santa Clara County: Anderson Dam, Kirby Canyon, and north of Llagas Avenue in Morgan Hill (USFWS 1998).

CNDDB/RAREFIND RECORDS: There are no CNDDB records for coyote ceonothus in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles.
HABITAT PRESENT IN PROJECT AREA? Habitat for coyote ceonothus exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

Mt. Hamilton thistle (*Cirsium fontinale* var. *campylon*)

HABITAT AND BIOLOGY: Herbaceous perennial herb 60 to 200 cm, found in serpentine seeps in chaparral, cismontane woodland, and valley/foothill grassland at elevations between 100 and 890 m Threatened by urbanization, trampling, and grazing (Hickman 1993; Tibor 2001).
BLOOMING: February-October
RANGE: Known from Alameda, Santa Clara, and Stanislaus Counties.
CNDDB/RAREFIND RECORDS: There are three records for the Mt. Hamilton thistle in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles. One record occurs in Hellyer Canyon south of San Jose, one record occurs at a mitigation site in the Silver Creek village, and one record occurs on the west side of Silver Creek.
HABITAT PRESENT IN PROJECT AREA? Habitat for the Mt. Hamilton thistle exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

Santa Clara Valley dudleya (*Dudleya setchellii*)

HABITAT AND BIOLOGY: Perennial herbaceous flower with fleshy leaves and peduncle growing 5 to 20 cm. Found in serpentine outcrops of valley and foothill grasslands and cismontane woodlands at elevations between 120 and 300 m. Threatened by urbanization/development, cattle grazing, and off-road vehicles (Hickman 1993; Tibor 2001).
BLOOMING: May-June
RANGE: Known from fewer than fifteen occurrences between San Jose and San Martin, CA.
CNDDB/RAREFIND RECORDS: There are five records for the Santa Clara Valley dudleya in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles. Two records occur in the Silver Creek area, one record occurs in the Communications Hill area, one record occurs north of Dana Rock Park, and one record occurs in the hills southwest of the Santa Clara Valley fairgrounds.
HABITAT PRESENT IN PROJECT AREA? Habitat for the Santa Clara Valley dudleya exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

San Francisco wallflower (*Erysium franciscanum*)

HABITAT AND BIOLOGY: Perennial herb often found on serpentine or granitic soils, in chaparral, coastal dunes, coastal scrub and valley/foothill grassland at elevations between 0 and 520 m.
BLOOMING: March-June
RANGE: Known from Marin, Santa Clara, Santa Cruz, San Francisco, San Mateo and Sonoma Counties. Rare and declining in Santa Cruz County.

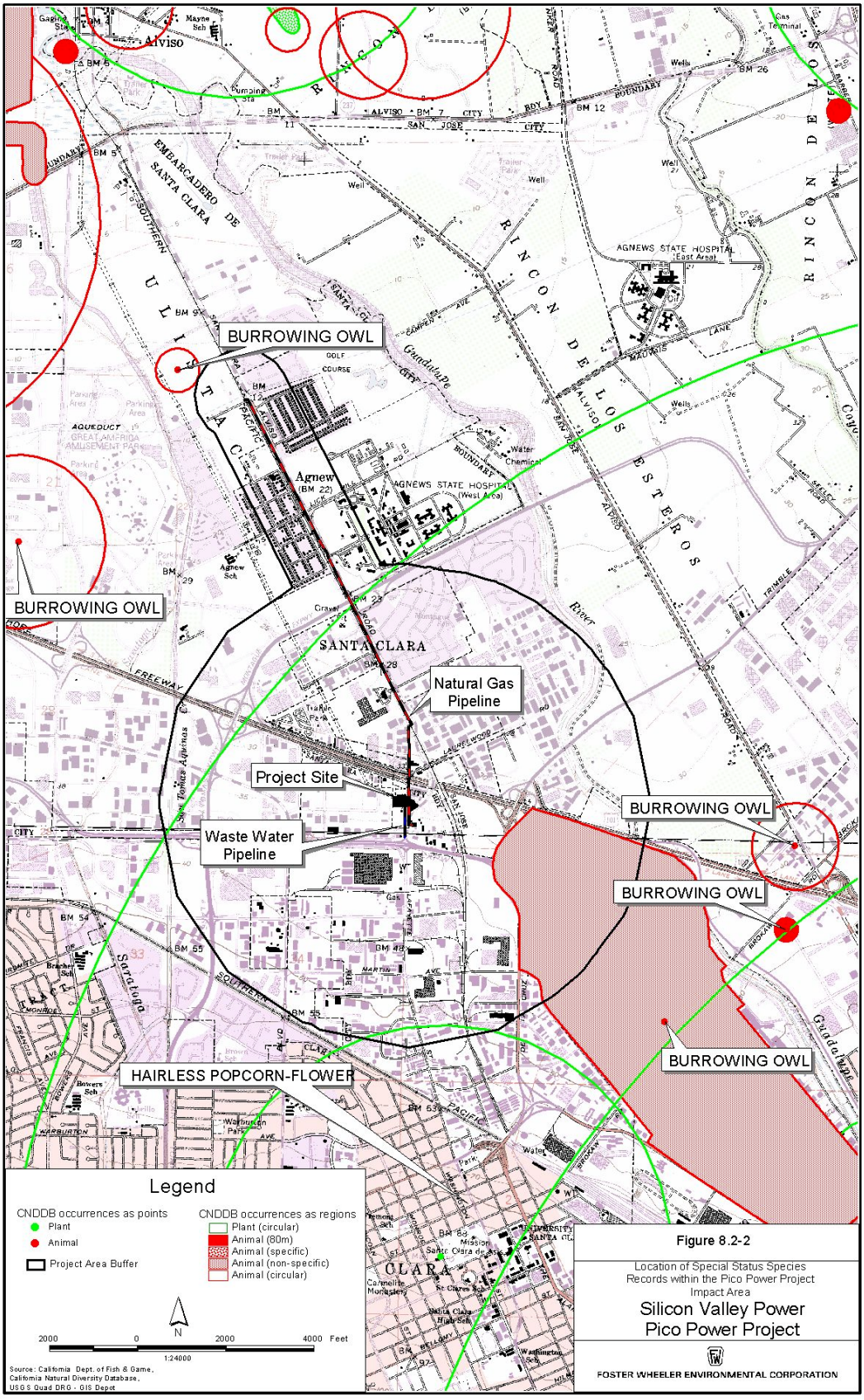

BURROWING OWL
BURROWING OWL
Natural Gas Pipeline
Project Site
Waste Water Pipeline
BURROWING OWL
BURROWING OWL
BURROWING OWL
HAIRLESS POPCORN-FLOWER
Legend
CNDDB occurrences as points
Plant
Animal
Project Area Buffer
CNDDB occurrences as regions
Plant (circular)
Animal (80m)
Animal (specific)
Animal (non-specific)
Animal (circular)
N
2000 0 2000 4000 Feet
1:24000
Source: California Dept. of Fish & Game, California Natural Diversity Database, USGS Quad DRG - GIS Depot
Figure 8.2-2
Location of Special Status Species Records within the Pico Power Project Impact Area
Silicon Valley Power
Pico Power Project
FOSTER WHEELER ENVIRONMENTAL CORPORATION

Table 8.2-1. Special status plant species potentially occurring in the project area.

Scientific Name	Common Name	Federal/ State/ CNPS[1]	Source[2]	Habitat in impact area?	Blooms
Astragalus tener var. *tener*	Alkali milk-vetch	SC/--/1B	1,2	No	Mar-May
Atriplex depressa	Brittlescale	SC/--/1B	1	No	May-Oct
Atriplex joaquiniana	San Joaquin saltbush	SC/--/1B	1,2	No	
Balsamohriza macrolepis var. *macrolepis*	Big-scale balsamroot	SC/--/1B	1	No	Mar-June
Castilleja affinis ssp. *neglecta*	Tiburon Indian paintbrush	E/T/1B	1	Yes	Apr-Jun
Ceanothus ferrisae	Coyote ceanothus	E/T/1B	1	Yes	Jan-May
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	SC/--/1B	1,2	No	Jun-Nov
Chorizanthe robusta var. *robusta*	Robust spineflower	E/--/1B	1,2	No	Apr-Sep
Cirsium fontinale var. campylon	Mt. Hamilton thistle	SC/--/1B	1,2	Yes	Feb-Oct
Cordylanthus maritimus ssp. *palustris*	Point Reyes bird's-beak	SC/--/1B	1,2	No	Jun-Oct
Cordylanthus mollis ssp. *hispidus*	Hispid bird's beak	SC/R/1B	1	No	Jul-Sep
Dudleya setchellii	Santa Clara Valley dudleya	E/--/1B	1	Yes	Apr-Jun
Erysium franciscanum	San Francisco wallflower	SC/--/4	1	Yes	Mar-Jun
Fritillaria liliacea	Fragrant fritillary	SC/--/1B	1,2	Yes	Feb-Apr
Helianthella castanea	Diablo rock rose	SC/--/1B	1	No	Apr-Jun
Horkelia cuneata ssp. *sericea*	Kellog's horkelia	SC/--/1B	1	No	Apr-Sept
Lasthenia conjugens	Contra Costa goldfields	E/--/1B	1,2	No	Mar-Jun
Lathyrus jepsonii	Delta tule pea	SC/--/1B	1	No	May-Jun
Lessingia micradenia var. *glabrata*	Smooth lessingia	SC/--/1B	1	Yes	Jul-Nov
Lilaeopsis masonii	Masons lilaeopsis	SC/R/1B	1	No	Apr-Oct
Linanthus ambiguus	Serpentine linanthus	--/--/4	1	Yes	Mar-Jun
Malacothamnus hallii	Hall's bush mallow	SC/--/1B	1,2	Yes	May-Sep
Plagiobothrys glaber	Hairless popcorn-flower	SC/--/1A	1,2	No	Apr-May
Streptanthus albidus ssp. *albidus*	Metcalf Canyon jewelflower	E/--/1B	1,2	Yes	Apr-Jul
Streptanthus albidus ssp. peramoenus	Most beautiful jewelflower	SC/--/1B	1	Yes	Apr-Jun
Suaeda californica	California seablite	PE/--/1B	1	No	Jul-Oct
Trifolium amoenum	Showy Indian clover	E/--/1B	1	No	Apr-Jun
Tropidocarpum capparideum	Caper-fruited tropidocarpum	SC/--/1A	2	No	Mar-Apr

[1] **Status Categories:**
State status determined from *Special Plants List* (June 1999), and/or *State and Federally Listed Endangered, Threatened, and Rare Plants of California* (April 2002), prepared by DFG Natural Diversity DataBase. CNPS status determined from *CNPS Inventory of Rare and Endangered Vascular Plants of California* (Tibor 2001). Codes used in table are as follows:
E = Endangered; **T** = Threatened; **R** = California Rare; **PE** = Proposed Endangered, **C** = Candidate:
Taxa for which the USFWS has sufficient biological formation to support a proposal to list as endangered or threatened,
SC = USFWS Species of Concern: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.
SSC = DFG "Species of Special Concern.", CNPS List: **1A** = Presumed Extinct in CA; **1B** = Rare or Endangered in CA and elsewhere; **2** = R/E in CA and more common elsewhere; **3** = Need more information; **4** = Plants of limited distribution. -- = Species not state-listed.

[2] **Source:** 1 = From USFWS; 2 = From CNDDB/ RareFind.

CNDDB/RAREFIND RECORDS: There are no CNDDB records for the San Francisco wallflower in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles.
HABITAT PRESENT IN PROJECT AREA? Habitat for the San Francisco wallflower exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

Fragrant fritillary (*Fritillaria liliacea*)

HABITAT AND BIOLOGY: Bulbiferous perennial herb, often found in serpentine soils in cismontane woodland, coastal prairie, coastal scrub and valley/foothill grassland at elevations between 3 and 410 m. Threatened by grazing, agriculture, urbanization, and non-native plants.
BLOOMING: February-April
RANGE: Known from Alameda, Contra Costa, Monterrey, Marin, San Benito, Santa Clara, San Francisco, San Mateo, Solano, and Sonoma Counties.
CNDDB/RAREFIND RECORDS: There are two records for the fragrant fritillary in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles. One record occurs in Alum Rock Park, and one record occurs east of the town of Evergreen.
HABITAT PRESENT IN PROJECT AREA? Habitat for the fragrant fritillary exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

Smooth lessingia (*Lessingia micradenia* var. *glabrata*)

HABITAT AND BIOLOGY: Erect annual herb 5 to 60 cm, found in serpentine soils in chaparral and cismontane woodland, often in roadcuts. Occurs at elevations between 120 and 420 m.
BLOOMING: July-November
RANGE: Known from eleven occurrences in Santa Clara County. The only extant occurrences are known from the Madrone area, the Anderson Reservoir, and the Gilroy area (USFWS 1998).
CNDDB/RAREFIND RECORDS: There are no CNDDB records for smooth lessingia in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles.
HABITAT PRESENT IN PROJECT AREA? Habitat for smooth lessingia exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

Serpentine linanthus (*Linanthus ambiguus*)

HABITAT AND BIOLOGY: Annual herb usually found in serpentine soils in cismontane woodland, coastal scrub, valley/foothill grassland at elevations between 120 and 1130 m.
BLOOMING: March-June
RANGE: Known from Alameda, Contra Costa, Merced, San Benito, Santa Clara, Santa Cruz, San Joaquin, San Mateo, Stanislau counties. Also expected in other adjacent counties.
CNDDB/RAREFIND RECORDS: There are no CNDDB records for serpentine linanthus in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles.
HABITAT PRESENT IN PROJECT AREA? Habitat for serpentine linanthus exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

Hall's bush mallow (*Malacothamnus hallii*)

HABITAT AND BIOLOGY: Evergreen shrub found in chaparral and coastal scrub at elevations between 10 and 760 m. Often found on serpentine soils.
BLOOMING: May-September
RANGE: Known from Contra Costa, Merced, Santa Clara, and Stanislau counties. Possibly in Alameda County as well.
CNDDB/RAREFIND RECORDS: There are two records for Hall's bush mallow in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles. One record occurs in the Silver Creek area, and one record occurs in the Guadalupe Creek area.
HABITAT PRESENT IN PROJECT AREA? Habitat for Hall's bush mallow exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

Metcalf Canyon jewel-flower (*Streptanthus albidus* ssp. *albidus*)

HABITAT AND BIOLOGY: Annual herbaceous flower growing 50 to 120 cm tall. Found in valley and foothill grasslands in open areas with serpentine soils at elevations between 150 and 800 m. Threatened by development and off-road vehicles (Hickman 1993; Tibor 2001).
BLOOMING: April-July
RANGE: Known from fewer than ten (extant) occurrences in Santa Clara County. Occurrences are from the Coyote Ridge area between San Jose and Anderson Lake (Hickman 1993, Tibor 2001).
CNDDB/RAREFIND RECORDS: There are five records for the Metcalf Canyon jewel flower in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles. Three records occur in the Silver Creek area, one record occurs in a ridge north of Dana Rock Park in San Jose, and one record occurs in the Communication Hills area.
HABITAT PRESENT IN PROJECT AREA? Habitat for the Metcalf Canyon jewel flower exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

Most beautiful jewel-flower (*Streptanthus albidus* ssp. *peramoenus*)

HABITAT AND BIOLOGY: Annual herb 20 to 80 cm found in serpentine soils in chaparral, cismontane woodland and valley/foothill grassland at elevations between 120 and 1,000 m. Threatened by development and grazing.
BLOOMING: April-June
RANGE: Known from Alameda, Contra Costa, Monterrey, and Santa Clara counties. There are thirteen occurrences in the serpentine ridges of Santa Clara County.
CNDDB/RAREFIND RECORDS: There are no CNDDB records for the most beautiful jewel-flower in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles.
HABITAT PRESENT IN PROJECT AREA? Habitat for the most beautiful jewel-flower exists in the serpentine grasslands in the hills surrounding the Santa Clara Valley, including the Bay checkerspot butterfly critical habitat units.

Special Status Wildlife Species

Table 8.2-2 lists the special status wildlife species in the vicinity of the PPP project components, based on CNDDB/RareFind and USFWS data. Locations of species historically located within one mile of the PPP project components are mapped on Figure 8.2-2. Brief descriptions of special status wildlife species that

may occur in the project area are presented below. Habitat for these species occurs near the project site, but does not occur at the plant site, compressor station site, along the natural gas pipeline or wastewater discharge pipeline, or at any of the construction laydown and parking areas.

Birds

Western burrowing owl (*Athene cunicularia hypugea*)

HABITAT AND BIOLOGY: Forages day and night in open dry grassland and desert habitats, and in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats. Nests in old burrows of ground squirrels or other small mammals. Eats mostly insects; also feeds on small mammals reptiles, birds, and carrion. Short vegetation may increase prey availability, enhance predator detection, and attract burrowing mammals that provide nest sites for burrowing owls. Burrowing owls usually migrate from their nesting site during the winter, but may use their burrow or other burrows as winter shelter. Breeds from March through August. Year-long resident in CA.
RANGE: Central Valley, Sierra Nevada, and Coast ranges.
CNDDB/RAREFIND RECORDS: There are twelve CNDDB records for the western burrowing owl in the San Jose West and Milpitas topographic quadrangles.
NESTING/FORAGING HABITAT PRESENT IN STUDY AREA: Nesting/Foraging habitat exists approximately 0.16 mile east of the project site, in the riparian zone of the Guadalupe River and adjacent open fields.

Invertebrates

Bay checkerspot butterfly (*Euphydryas editha bayensis*)

HABITAT AND BIOLOGY: Habitat for this species occurs on shallow, serpentine-derived, or similarly droughty or infertile soils, which support the butterfly's larval food plants as well as nectar sources for adults. The Bay checkerspot's life cycle is closely tied to the host plant's biology. Host plants germinate anytime from early October to late December, and senesce (dry up and die) from early April to mid May; most of the active parts of the Bay checkerspot life cycle also occur during this period. The primary larval host plant of the Bay checkerspot is dwarf plantain (*Plantago erecta*) which is an annual, native plantain. Secondary host plants such as purple owl's-clover (*Castilleja* (a.k.a. *Orthocarpus*) *densiflora*) and exserted paintbrush *(Castilleja exserta* (a.k.a. *Orthocarpus purpurascens*)) may be used by Bay checkerspot larvae when dwarf plantain dries up. Nectar plants commonly used by adult butterflys include desert parsley (*Lomatium* spp.), California goldfields (*Lasthenia californica*), tidy-tips (*Layia platyglossa*), and *Muilla maritimo* (USFWS 1998).
RANGE: Bay checkerspot butterfly range is believed to consist of five core areas. One area is located in Edgewood County Park (San Mateo County), the other four core areas occur in Santa Clara County along a ridge between San Jose and Morgan Hill (USFWS 1998).

Table 8.2-2. Special status wildlife species evaluated in the PPP project area.

Scientific Name	Common Name	Federal/ State[a]	Habitat in impact area?	Source [b]
Invertebrates				
Adela oplerella	Opler's longhorn moth	SC/--	Yes	1,2
Branchinecta lynchi	Vernal pool fairy shrimp	T/--	No	1
Calicina (=*Sitalcina*) *minor*	Edgewood blind harvestman	SC/--	No	1,2
Euphydryas editha bayensis	Bay checkerspot butterfly	T/--	Yes	1,2
Hydrochara rickseckeri	Ricksecker's water scavenger beetle	SC/--	No	1
Lepidurus packardi	Vernal pool tadpole shrimp	E/--	No	1,2
Microcina homi	Hom's microblind harvestman	SC/--	No	1
Microcina juni	Jung's microblind harvestman	SC/--	No	1
Speyeria adiaste adiaste	Unsilvered fritillary butterfly	SC/--	No	1
Fish				
Eucyclogobius newberryi	Tidewater goby	E/--	No	1
Hypomesus transpacificus	Delta smelt	T/T	No	1
Oncorhynchus mykiss irideus	Central California coastal steelhead	T/--	No	1,2
	South central California steelhead	T/SC		
Oncorhynchus tshawytscha	Winter-run chinook salmon	E/CE	No	1
	Central valley spring-run chinook salmon	T/CT		
Oncorhynchus tshawytscha	Central valley fall/late-fall run chinook salmon	C/SC	No	1
Pogonichthys macrolepidotus	Sacramento splittail	T/SC	No	1
Spirinchus thaleichthys	Longfin smelt	SC/SC	No	1
Amphibians				
Ambystoma californiense	California tiger salamander	E/SC	No	1,2
Rana aurora draytonii	California red-legged frog	T/SC	No	1,2
Rana boylii	Foothill yellow-legged frog	SC/SC	No	1,2
Scaphiopus hammondii	Western spadefoot	SC/SC	No	1
Reptiles				
Anniella pulchra pulchra	Silvery legless lizard	SC/SC	No	1
Clemmys marmorata	Western pond turtle	SC/SC	No	1,2
Clemmys marmorata marmorata	Northwestern pond turtle	SC/SC	No	1
Clemmys marmorata pallida	Southwestern pond turtle	SC/SC	No	1
Masticophis flagellum ruddocki	San Joaquin coachwhip (=whipsnake)	SC/SC	No	1
Phrynosoma cornatum frontale	California horned lizard	SC/SC	No	1
Rana aurora draytonii	California red-legged frog	T/SC	No	1,2
Birds				
Agelaius tricolor	Tricolored blackbird (nesting colony)	SC/SC	No	1
Aquila chrysaetos	Golden eagle	--/SC	No	2
Amphispiza belli belli	Bell's sage sparrow (nesting)	SC/SC	No	1
Ardea herodias	Great blue heron (rookery)	--/SC	No	2

Table 8.2-2. (continued.)

Scientific Name	Common Name	Federal/ State[1]	Habitat in impact area?	Source [2]
Athene cunicularia	Western burrowing owl (burrow sites)	SC/SC	Yes	1,2
Brachyramphus marmoratus	Marbled murrelet (nesting)	T/CE	No	1
Buteo regalis	Ferruginous hawk (wintering)	SC/SC	No	1
Charadrius alexandrinus nivosus	Western snowy plover (nesting)	T/SC	No	1,2
Charadrius montanus	Mountain plover (wintering)	PT/SC	No	1
Elanus leucurus	White-tailed kite	--/SC	No	2
Empidonax traillii brewsteri	Little willow flycatcher (nesting)	SC/--	No	1
Falco peregrinus anatum	American peregrine falcon (nesting)	D/E/	No	1
Geothlypis trichas sinuosa	Saltmarsh common yellowthroat	--/SC	No	2
Haliaeetus leucocephalus	Bald eagle (nesting and wintering)	T/E	No	1
Pelecanus occidentalis	California brown pelican (nesting colony)	E/E	No	1
Rallus longirostris obsoletus	California clapper rail	E/E	No	1
Riparia riparia	Bank swallow (nesting)	SC/T	No	1
Sterna antillarum browni	California least tern (nesting colony)	E/E	No	1
Vireo bellii pusillus	Least Bell's vireo (nesting)	E/E	No	1
Mammals				
Corynorhinus (= Plecotus) townsendii townsendii	Pacific western big-eared bat	SC/SC	No	1
Dipodomys heermanni berkrleyensis	Berkely kangaroo rat	--/SC	No	2
Eumops perotis californicus	Greater western mastiff bat	SC/SC	No	1
Myotis ciliolabrum	Small-footed myotis bat	SC/--	No	1
Myotis evotis	Long-eared myotis bat	SC/--	No	1
Myotis thysanodes	Fringed myotis bat	SC/--	No	1
Myotis volans	Long-legged myotis bat	SC/--	No	1
Myotis yumanensis	Yuma myotis bat	SC/--	No	1
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	SC/SC	No	1
Reithrodontomys raviventris	Salt marsh harvest mouse	E/E	No	1,2
Sorex vagrans halicoetes	Salt marsh wandering shrew	--/SC	No	2
Sylvilagus bachmani riparius	Riparian brush rabbit	E/E	No	1
Vulpes macrotis mutica	San Joaquin kit fox	E/T	No	1,2

[1] **Status Categories:**

Federal status determined from the USFWS letter. State status determined from *State and Federally Listed Endangered and Threatened Animals of California* (January 1999) and *Special Animals* (March 1998), prepared by DFG Natural Diversity Data Base. Codes used in table are as follows:

E = Endangered; **T** = Threatened; **R** = California Rare; **PT** = Proposed Threatened

C = Candidate: Taxa for which the USFWS has sufficient biological formation to support a proposal to list as endangered or threatened.

SC = USFWS Species of Concern: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

SSC = CDFG "Species of Special Concern"

FP = CDFG "Fully Protected"

CNPS List: **1A** = Presumed Extinct in CA; **1B** = Rare or Endangered in CA and elsewhere; **2** = R/E in CA and more common elsewhere; **3** = Need more information; **4** = Plants of limited distribution.

-- = Species not state-listed.

[2] **Source: 1** = From USFWS letter **2** = From CNDDB/ RareFind.

CNDDB/RAREFIND RECORDS: There is one CNDDB record for the Bay checkerspot butterfly in the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles. The record occurs in the Silver Creek Hills.
HABITAT PRESENT IN PROJECT AREA? The USFWS has designated approximately 24,000 acres of serpentine grassland as critical habitat for the Bay checkerspot butterfly, with 15 units within San Mateo and Santa Clara Counties. Serpentine grassland exists 7.1 miles to the southeast of the project site, and 11.5 miles south of the project site.

Opler's longhorn moth (*Adela oplerella*)

HABITAT AND BIOLOGY: Opler's longhorn moth occurs only in serpentine grassland where its larval food plant, California cream cups (*Platystemon californicus*), is known to grow. The life cycle of Opler's moth is closely tied to its host plant's biology. Adult moths lay eggs in the flowers of the host plant in late spring, early summer. Once the eggs hatch, the larvae feed on the seeds of developing fruit for a few weeks before dropping to the ground nearby to feed on the lower portions of the flowers. The larvae then spend the summer in diapause to re-emerge when the cream cups have begun germinating again in the winter. Opler's longhorn moths have been commonly found on other plants including goldfields (*Lasthenia* spp.), tidy tips (*Layia* spp.), and linanthus (*Linanthus* spp.). The populations of Opler's longhorn moth are threatened by development of serpentine habitat, invasive exotic species out-competing the larval host plants, and overgrazing (USFWS 1998).
RANGE: This species is known from Marin Co. and from the inner Bay Area from Alameda County to Santa Clara Co. Currently there are nine known populations in Santa Clara Co. (USFWS 1998).
CNDDB/RAREFIND RECORDS: There are no CNDDB/RareFind records for this species occur in the the San Jose West, San Jose East, Milpitas, and Calaveras Reservoir topographic quadrangles.
HABITAT PRESENT IN PROJECT AREA: Based on review of the CNDDB, USFWS information, and other technical sources, potential habitat for this species occurs in the serpentine grassland that has been designated as critical habitat units for the bay checkerspot butterfly. Serpentine grassland exists 7.1 miles to the southeast of the project site, and 11.5 miles south of the project site.

8.2.1.9 Field Survey Methods

Biological field surveys for the PPP project were conducted by biologist Jane Valerius on April 26, 2002, and on June 14 and June 28, 2002 by Brett D. Hartman (qualifications are presented in Appendix 8.2-C). The area surveyed included a one-mile radius from the Project site, and at least 1,000 feet in each direction from the project's linear facilities. The power plant site, gas metering and compressor station sites, and construction laydown and parking areas were also surveyed. This section describes the field survey methods used to determine biological resources that could be affected by project.

Vegetation

Plant surveys included the following tasks:

- Site surveys to determine the type and location of vegetation communities
- Vegetation mapping
- Preparation of plant lists

Activities associated with the special status plant species surveys included the following:

- Consultation with CDFG and USFWS regarding potential occurrence of state- and federally-listed plant species on or near the project area
- Determination of CNPS status of special status plant species using the CNPS electronic inventory (Tibor 2001)
- Determination of habitat preference and flowering times of special status plant species
- Field surveys of the PPP plant site, linear facilities, and construction laydown areas, during April and June 2002.

A list of plant species observed at the project site, linear facilities, and construction laydown areas during 2001 botanical surveys is presented in Table 8.2-3 (following page). A map of biological resources within one mile of the project site is shown in Figure 8.2-3 (in pocket at back of section).

Wildlife Surveys

Wildlife surveys at the proposed PPP project facilities were conducted during the spring of 2002 by biologist Brett D. Hartman. Protocol surveys for burrowing owl in suitable habitat at the Guadalupe River and surrounding open space were not conducted, as resident burrowing owls or breeding pairs will not be affected by project construction or operation. In addition, surveys for the Bay checkerspot butterfly in the serpentine grasslands in the surrounding hills have not been conducted, since the USFWS regulates these areas as critical habitat units. A list of wildlife species observed during surveys of the project site and associated facilities is provided in Table 8.2-4.

Table 8.2-4. Wildlife species observed during 2002 wildlife surveys.

Common Name	Scientific name
Brewer's blackbird	*Euphagus cyanocephalus*
Burrowing owl	*Athene cunicularia*
Common Crow	*Corvus brachyrhynchos*
Mallard	*Anas platyrhynchos*
Mourning dove	*Zenaida macroura*
Rock dove	*Columba livia*

Wetland Delineation

A wetland delineation was performed for the PPP plant site. Standard methodology as defined in the Corps of Engineers Wetlands Delineation Manual (1987) was used. The wetland delineation included the following tasks:

- Review of available data on the site, including 7.5-minute topographic maps for the San Jose and Milpitas quadrangles and historical aerial photographs
- Field surveys of the project site on April 26, 2002

Table 8.2-3. Plant species observed during botanical surveys for the PPP project.

Scientific Name	Common Name
Avena sp.	Wild oats
Baccharis pilularis	Coyote bush
Brassica nigra	Black mustard
Brassica rapa	Mustard
Bromus catharticus	Brome
Bromus diandrus	Ripgut brome
Bromus hordeaceus	Soft chess
Capsella bursa-pastoris	Shepherd's purse
Carduus pycnocephalus	Italian thistle
Centaurea solstitialis	Yellow star thistle
Chamomilla suaveolens	Pineapple weed
Chenopodium sp.	Lamb's quarters
Convolvulus arvensis	Bindweed
Coronopus didymus	Wart or swine cress
Cyperus sp.	Umbrella sedge
Erodium spp.	Filarees
Foeniculum vulgare	Fennel
Geranium molle	Geranium
Geranium dissectum	Cut-leaf geranium
Hordeum marinum	Mediterranean barley
Hordeum murinum ssp. *leporinum*	Hare barley
Lactuca serriola	Prickly lettuce
Lepidium latifolium	Perennial pepperweed
Liquidambar sp.	Sweet gum
Lolium multiflorum	Annual ryegrass
Lotus corniculatus	Bird's foot trefoil
Malva sp.	Cheeseweed
Melilotus indica	Yellow sweet clover
Nerium oleander	Oleander
Phalaris sp.	Canary grass
Picris echioides	Bristly ox-tongue
Pinus radiata	Monterey Pine
Polygonum sp.	Knotweed
Polypogon monspeliensis	Rabbitsfoot grass
Raphanus sativus	Wild radish
Rubus discolor	Himalayan blackberry
Senecio vulgaris	Common groundsel
Sisybrium sp.	Mustard
Solanum sp.	Solanum
Sonchus asper	Sowthistle
Ulmus sp.	Elm

8.2.1.10 Power Plant Site

The project site is located in the urban industrial zone of the City of Santa Clara, just south of Highway 101. The proposed PPP plant site is bordered on the east by Lafayette Street, and by urban/commercial development on the north, west, and south. Figure 8.2-3 (in map pocket) shows biological resources noted within one mile of the plant site and 1,000 feet of the project linear facilities at a scale of 1:6,000.

Vegetation

The proposed project area is comprised of bare ground and ruderal (weedy) non-native vegetation species such as bristly ox-tongue (*Picris echioides*) and wild oat (*Avena fatua*). Much of the site is bare ground since it is part of an existing substation, maintenance yard, and parking area. There are patches of weeds under the transmission line tower and along the fences. On the east side of the project area there is a group of elm trees (non-native ornamental trees) with Himalayan blackberry as understory, approximately 170 feet long and 30 feet wide. There is a narrow ditch in among the trees. This is a limited water collection sump used by the City of Santa Clara when cleaning street sweeping machines, and is not a creek or natural drainage.

East of the line of trees is a large area where soil and other materials swept from the streets are deposited. This area is comprised entirely of tall, weedy plants such as mustards (*Brassica* spp.), wild oats (*Avena* sp.), wild radish (*Raphanus sativus*), prickly lettuce (*Lactuca serriola*), bromes (*Bromus* spp.), and hare barley (*Hordeum murinum* ssp. *leporinum*). There is also a large patch of perennial pepperweed (*Lepidium latifolium*) at the northern portion of this ruderal field. No special-status plant species were observed on the PPP project site, and the site is not considered a sensitive natural resource.

Wildlife

Wildlife species use of the project site is limited to common urban species. The only special status species with the potential to occur within a one-mile radius of the site is the burrowing owl. The PPP plant site does not provide habitat for burrowing owls, due to lack of suitable foraging habitat. No burrowing owls were observed during surveys nor was there evidence of burrowing owl activity at the proposed PPP plant site.

The CDFG Staff Report on Burrowing Owl Mitigation (CDFG 1995) states that a 500-foot buffer is required around burrowing owl habitat. The closest burrowing owl habitat to the proposed PPP plant site, as delineated by the CNDDB, is open land that is part of the San Jose Airport, located 0.38 mile (2006 feet) to the east of the project site. Due to the intervening industrial development and the presence of the airport runway, there is a high degree of background noise to which any resident owls will be acclimated.

Wetlands

There is a narrow ditch in the center of the line of trees on the eastern portion of the site. This area has an appearance similar to that of a natural drainage channel or small creek. However, examination of historical aerial photographs indicated the depression was created sometime after 1971 (SCS Engineers 2002). It is used as a limited water collection sump by the City of Santa Clara when cleaning street sweeping machines, and is not a creek or natural drainage. The water in the ditch is due to vehicle cleaning. The vehicle cleaning operation uses a stand pipe (possibly a tap to the recycled water pipeline that runs through the property) as a source of on-site water. Mounds of dirt near the southern end of the ditch indicate where sediments have been removed from the ditch and piled next to it. It was determined that this area is not a jurisdictional wetland, as the depression will lack the necessary hydrologic characteristics when the vehicle cleaning is halted as scheduled this fall.

There is a large patch of perennial pepperweed (*Lepidium latifolium*) at the northern portion of the ruderal field on the east side of the project site. Perennial pepperweed is a very invasive, noxious weed and is also a facultative wetland (FACW) plant species. A soil pit was excavated within the patch of perennial pepperweed to determine if this area could potentially qualify as a jurisdictional wetland. The soils were a silty material, obviously composed of urban fill from the street sweepings, and had a soil color of 7.5YR2.5/1. The soil was dry and there were no oxidized root channels or other evidence of wetland hydrology. It was determined that this area is not a jurisdictional wetland, as defined by the U.S. Army Corps of Engineers, based on the lack of hydrology and the extremely disturbed nature of the site.

8.2.1.11 Natural Gas Compressor Station

The natural gas compressor station will be located the City-owned lot across Lafayette Street from the PPP project site, on the corner of Lafayette and Comstock streets. This lot is mostly paved, except for an open and unused strip on Comstock Street, and the area within an abandoned electrical substation, formerly gravelled, now invaded with ruderal species. Construction of the compressor station on this lot will not adversely affect wildlife habitat or sensitive species.

8.2.1.12 Natural Gas Pipeline and Metering Station

The natural gas pipeline corridor runs south along Lafayette Street from a connection site at Gianera Street and Wilcox Avenue. The gas metering station will be located near this connection point, in an existing unvegetated bicycle-pedestrian corridor. The natural gas pipeline will end at the gas compressor station across Lafayette Street from the PPP project site, on the corner of Lafayette and Comstock streets and an auxiliary line will run back to the power plant site. The pipeline will be constructed within Lafayette and Bassett Streets and will use directional boring or boring and jacking to cross under the Union Pacific Railroad tracks, and US Highway 101. It will not affect biological or wetland resources located along this route.

A burrowing owl was observed approximately 0.34 mile east of the natural gas connection point with PG&E Line 132 at Gianera Street and Wilcox Avenue, along the San Tomas Aquinas Creek riparian corridor, which provides foraging habitat. This is beyond the 500-foot buffer required by the CDFG (CDFG 1995) for burrowing owl mitigation. In addition, the long distance, presence of the a residential area between the easement and the burrow site, and lack of foraging habitat in the pipeline crossing of the Union Pacific Railroad tracks to Lafayette Street make it unlikely that burrowing owls will use any part of the pipeline right-of-way for forage. Burrowing owls are not likely to be significantly affected by ground disturbance or equipment noise and vibration due to construction of the natural gas pipeline.

8.2.1.13 Waste Water Discharge Pipeline

The proposed pipeline will be installed within an existing utility easement in former Pico Way (on the project site) and Lafayette Street, to a tie-in point in Central Expressway.

8.2.1.14 Construction Laydown and Worker Parking Areas

Construction laydown areas include a parcel an area within the SVP Scott Receiving Station, an area within the Kifer Substation, and portions of the City's property at Lafayette and Comstock Streets, a vacant lot adjacent to the SVP Brokaw substation located between De La Cruz Boulevard, Coleman Avenue, and the Caltrain right-of-way (behind Costco and Federal Express). These areas are almost entirely paved, chip-sealed, or graveled, with some ruderal vegetation around their fringes. The dominant

species are bristly ox-tongue and wild oat. The use of the construction laydown areas will not affect biological or wetland resources located in these areas.

8.2.2 Environmental Consequences

8.2.2.1 Significance Criteria

Potential direct and indirect project impacts to biological resources associated with construction, operation, and maintenance of the PPP were evaluated. An impact would be considered significant if it: 1) resulted in the take of a listed species or its habitat; 2) take of sensitive species or its habitat that jeopardized its viability, either locally or range-wide; or 3) loss of species or populations necessary to maintain current distribution.

8.2.2.2 Construction Phase Impacts

Power Plant Site

Construction of the PPP footprint will result in the permanent loss of approximately 2.86 acres of disturbed ruderal vegetation, as well as a constructed ditch and the introduced ornamental trees. These are not considered significant biological resources. No special status plant species were found at the PPP plant site and none will be affected by construction of the plant.

Construction of this project will likely result in the loss of individuals of several wildlife species occupying this site or dependent upon this site for specific physiological and ecological requirements. However, these species have no special protection status, are common to many areas, and are primarily limited to urban wildlife species.

Noise and activity from construction activities will have a negligible and temporary effect on wildlife use of the habitat along the Guadalupe River and adjacent open space, as wildlife in the area have become habituated to the noise of the City of Santa Clara industrial zone and the airport runway. It is unlikely that noise and vibration from construction and operation of the PPP plant will cause significant effects to burrowing owls.

Natural Gas Compressor Station

Construction of the natural gas compressor station is not expected to result in any significant and long-term effects on biological and wetland resources, since sensitive habitats or resources are not present in or near the station.

Natural Gas Pipeline and Metering Station

Construction of the natural gas pipeline is not expected to result in any significant and long-term effects on biological and wetland resources, since sensitive habitats or resources are not present in or near the gas pipeline right-of-way or metering station.

Waste Water Discharge Pipeline

Construction of the wastewater discharge pipeline is not expected to result in any significant and long-term effects on biological and wetland resources, since sensitive habitats or resources are not present in or near the pipeline right-of-way.

Construction Laydown and Worker Parking Areas

Use of the construction laydown and worker parking areas is not expected to result in any significant and long-term effects on biological and wetland resources, since sensitive habitats or resources are not present in or near the construction laydown and worker parking areas.

8.2.2.3 Operation Phase Impacts

Power Plant Site

Direct Effects

Once constructed and operational, the facility will have a minimal effect on wildlife resources in the area. Operation of the PPP will produce some noise, as described in Section 8.7 (Noise). Due to the close proximity of existing industrial plants, city streets, and railroad tracks), the noise generated during operation of the PPP facility is not expected to boost noise levels to a degree that will significantly affect wildlife habitat along the Guadalupe River and adjacent open space or other areas near the plant.

Indirect Effects

The USFWS has in recent years expressed concern over the potential effects of various types of land development on the critical habitat of the federally threatened Bay checkerspot butterfly (USFWS 1988). The butterfly's critical habitat consists of serpentine grassland, or, grassland located on soils derived from serpentine rock. These soils are found in limited areas southeast, south, and northeast of the project site (7.1, 11.5, and 5.8 miles, respectively).

The USFWS has proposed that nitrates deposited from power plants, automobiles, and other emission sources fertilize non-native species growing in the serpentine grassland and that the rate of deposition may increase with a growing population in the Santa Clara Valley. These non-native species may then grow aggressively and discourage the growth of native species and rare species that are endemic to the serpentine grassland. Some of these native and endemic species provide food for the butterfly's larvae. High levels of nitrates would therefore reduce the larval food source, leading to a reduction in butterfly populations and eventual extinction.

In the analysis of power plant license applications for three natural gas-fired power plants in Santa Clara County, the CEC has considered the potential indirect effects of nitrogen deposition on serpentine endemic plant and invertebrate species, including the Bay checkerspot butterfly. The most similar of these cases to the PPP, and the most recent, is the Los Esteros Critical Energy Facility (LECEF, 01-AFC-12), located in north San Jose, approximately 4 miles from the PPP.

In their analysis of the LECEF (CEC 2001), the CEC Staff considered that several air pollutants, including nitrogen dioxide and ammonia slip, may react with the atmosphere to form agents, such as HN_3 and HNO_3, capable of stimulating plant growth. Emissions of these nitrates from LECEF could deposit on areas of serpentine rock outcrops several miles south of the LECEF, possibly stimulating the growth of non-native plants in areas of serpentine-derived soils that contain endemic species. The Staff expressed a concern that, if nitrates from the power plant were to stimulate non-native plant growth, this may have the indirect effect of discouraging growth of native plants, some of which are rare serpentine endemic plants, and some of which are host plants for the federally threatened Bay checkerspot butterfly.

Staff's conclusion was that "the project may have minor effects on the soils that support the host plants for these butterflies, but the cause-and-effect to show an indirect impact was occurring would be difficult to prove for several reasons." These reasons included the distance between the power plant and the area

of potential impact, the number other nitrate sources in the intervening area, the conservative nature of the air impact modeling. Staff did not find that LECEF would cause a significant indirect impact on the Bay checkerspot butterfly and did not recommend mitigation or conditions of certification relating to indirect impacts. Staff addressed the issue of air emission effects on the Bay checkerspot butterfly and other serpentine endemics as a potential cumulative effect (see Section 8.2.3 below). That is, they concluded that the LECEF could only be seen as having a potential effect on these species on a regional basis, and cumulatively with other sources of nitrate deposition.

The PPP would not have a significant indirect effect on the Bay checkerspot butterfly or other serpentine endemic species for the reasons cited above. The nearest serpentine habitat to the PPP is nearly six miles away. Sources of nitrate that might affect the serpentine habitat are regional in scope and dependent on prevailing meteorological patterns. These sources are many and diverse. Nitrate deposition in the key serpentine areas could increase, for example, due to the construction of new employment and industrial centers that would increase the flow of traffic near to these areas and thus increase the localized deposition of nitrates from automobiles and trucks. Singling out a single source of nitrates against this background and given the complexities of the meteorological patterns in the region, is difficult at best. The modeling that is done to assess air quality effects, furthermore, is very conservative. This is discussed further below.

The PPP has certain characteristics in common with LECEF, but its nitrate emissions would be at a much lower level. Though both projects would use GE LM6000 combustion turbines, the PPP will be a combined-cycle plant (2 combustion turbines and one steam turbine) and so will be permitted to emit approximately half of the NO_x per turbine hour of operation as the LECEF (2.5 ppm, compared with 5 ppm). Also, the LECEF, as permitted, included four combustion turbines. For these reasons, the nitrate emission levels from the PPP will be considerably lower than for the LECEF and any potential effect on serpentine endemic species would be much less. This issue is discussed further under Cumulative Impacts, below (Section 8.2.3), where there is a discussion of the ecology and population dynamics of the Bay checkerspot butterfly, nitrate deposition modeling methodology, and results of nitrate deposition modeling.

Natural Gas Compressor Station

Operation of the gas compressor station will not result in impacts to special status plants, animals, or wetlands unless a leak occurred. A rupture or leakage of the pipeline could result in reduced air quality and, in severe cases, a fire, but any potential effects on urban vegetation or wildlife, will be temporary.

Natural Gas Pipeline and Metering Station

Operation of the gas pipeline and metering station will not result in impacts to special status plants, animals, or wetlands unless a leak occurred. A rupture or leakage of the pipeline could result in reduced air quality and, in severe cases, a fire, but any potential effects on urban vegetation or wildlife, will be temporary.

Waste Water Discharge Pipeline

Operation and maintenance of the wastewater discharge pipeline will not affect biological resources.

Construction Laydown and Worker Parking Areas

Construction laydown and worker parking areas will return to their pre-construction uses after construction is completed. Hence, there will be no operation impacts.

8.2.3 Cumulative Impacts

There will be no permanent loss of special status plants or sensitive wildlife habitats as a result of the Pico Power Project. For this reason, the project would not cause direct significant cumulative impacts to special status plants or wildlife habitats in the project area.

The California Energy Commission and U.S. Fish and Wildlife Service (USFWS) have required power plant projects located in the Santa Clara Valley to assess the effects of their projects on the Bay checkerspot butterfly, as discussed above, under cumulative impacts. These projects have included the Calpine Metcalf Energy Center (MEC), Gilroy Energy Center (GEC), and Los Esteros Critical Energy Facility (LECEF).

The CEC Staff determined, as described above, that LECEF would not have a significant indirect impact on the Bay checkerspot butterfly or other serpentine endemic species. The CEC Staff concluded in the LECEF case, however, that air dispersion modeling shows some level of nitrogen deposition from LECEF on serpentine soils above ambient conditions. The Staff therefore concluded that, when combined with the US Highway 101 expansion, the addition of other new power plants in the airshed, and ambient conditions, the LECEF could have a cumulative adverse effect on serpentine soil species, and that purchase and management of lands to benefit the state and federally listed serpentine endemic species would mitigate this effect below the level of significance.

The LECEF owner offered to participate in reducing the potential cumulative effects of nitrate deposition through the acquisition of emission reduction credits and the purchase of serpentine grassland habitat, as well as through donation of a fund to manage the conservation of the Bay checkerspot butterfly.

The PPP's potential effect on critical habitat for the Bay checkerspot butterfly due to nitrogen deposition would be minimal and probably undetectable. Nevertheless, the Applicant offers to purchase or lease mitigation land; retire, reduce, or retrofit existing emissions sources; or some combination of emission reductions and land purchase in order to participate in reducing the potential cumulative effect of nitrogen deposition on serpentine soils and serpentine endemic species. For land purchased or leased, the Applicant will prepare a serpentine species management plan.

The discussion that follows describes relevant data regarding the biology of the Bay checkerspot butterfly and methodology that is being used to determine the extent of potential nitrogen deposition attributable to the project and the extent of mitigation necessary to offset its effects.

Biology of the Bay Checkerspot Butterfly

The Bay checkerspot butterfly (*Euphydryas editha bayensis*) is a federally-listed threatened species that inhabits remnant patches of serpentine grassland in the San Francisco Bay Area. The Bay checkerspot butterfly may have once inhabited both serpentine and non-serpentine soils, prior to the conversion of native bunchgrass to non-native annual grassland. The dry, nutrient poor, and sometimes toxic conditions found in serpentinized areas (the "serpentine syndrome", Kruckeberg 1984) have impeded the invasion of weedy species, allowing the persistence of native plants (Huenneke et al. 1990), including the host plants for the Bay checkerspot butterfly (*Plantago erecta*, *Castilleja densiflora*, *Castilleja exserta*).

The Bay checkerspot butterfly currently persists as a meta-population (Erlich and Murphy 1987), in which sub-populations exist in relative isolation, connected through low levels of dispersal. Local sub-population extinction and recolonization events are a natural part of regional meta-population dynamics. Local populations of the Bay checkerspot butterfly have been going extinct at an increased rate over the

past decade. Theories to explain these extinctions include increasing climate variability due to global warming (McLaughlin et al. 2002), increasing urbanization and habitat fragmentation over the last century (Erlich and Murphy 1987), and habitat degradation due to invasion by introduced European annual grasses (Weiss 1999).

The life history and population biology of the Bay checkerspot butterfly has been well-studied. The larvae are dependent on the host plants *Plantago erecta*, *Castilleja densiflora*, and *Castilleja exserta*, and must grow large enough to enter diapause before the plants senesce in the late spring to early summer. Weather conditions affect both the larvae and the host plants, with few larvae reaching diapause in very wet or dry years, causing population declines. While population levels subsequently increase during more favorable years, these fluctuations create a risk of Bay checkerspot butterfly population extinctions, especially during prolonged extreme weather events (Erlich and Murphy 1987) such as the California drought of the mid-1970s or the El Niño weather of 1982-1983 and 1997-1998.

Noting that rainfall had become increasingly variable, especially after 1971, McLaughlin et al. (2002) tested the hypothesis that increasing extreme wet or dry years had contributed to the extinctions at nearby Jasper Ridge. Using long term precipitation data from San Jose and extensive life history knowledge of the Bay checkerspot butterfly, they developed a model to simulate population fluctuations and risk of extinction pre- and post-1971. Results indicated that the amplitude of population fluctuations increased after 1971, and average time to extinction decreased from 444 years to 19 years at one location.

The authors argue that results of this model contradict alternative hypotheses for the extinctions, including host plant declines (butterfly abundance was poorly correlated with larval host plant cover), natural predators, and research impacts. The Bay checkerspot butterfly has possibly persisted through previous periods of climatic variability due to greater habitat continuity and extent. Current populations persist as isolated remnants in a highly urbanized environment, and face inevitable stochastic extinction.

Exacerbating the vulnerability of the Bay checkerspot butterfly is the observed invasion by non-native grasses, which has reduced host plant cover to the marginal, thin, rocky soils. Nitrogen deposition due to increased NO_x emissions from cars and other industrial sources has been cited as the primary factor. While single chemical constituents, deficient or toxic, have been argued to account for the serpentine phenomenon, the complex chemical, physical and biotic properties of serpentine soils must be viewed as a complex of interacting factors, or the "serpentine syndrome" (Kruckeberg 1984). These include, 1) high levels of minerals such as calcium, aluminum, nickel, chromium, and magnesium, 2) low levels of essential nutrients such as phosphorous and nitrogen, 3) sparse plant cover, and 4) high heat and moisture stress. A suite of serpentine endemic species have evolved that can tolerate these adverse conditions, often restricted to serpentine soils because they are outcompeted in other environments.

Despite the difficulty of establishing a single limiting factor in serpentine soils, several authors have proposed nitrogen (N) as a limiting nutrient. A primary line of evidence to support the nitrogen deposition theory are fertilization studies that demonstrate changes in species composition following additions of nitrogen fertilizer at a rate of 100 kg N ha^{-1} yr^{-1} (Dukes and Mooney 1999). This is up to 10 times the estimated rate of nitrogen deposition in the San Jose air basin (10-15 kg N ha^{-1} yr^{-1}, Weiss 1999). One study that used nitrogen fertilization at rates more comparable to atmospheric nitrogen deposition (10-50 kg N ha^{-1} yr^{-1}) showed a shift in dominance from native C_4 grasses to introduced C_3 grasses (Wedin and Tillman 1996).

The levels of nitrogen deposition used in fertilization studies is significant. Nutrient cycling dynamics and rates of nitrogen accumulation in serpentine grasslands is poorly understood. Dr. Boursier (*cited in*

Coyote Valley Research Park DEIR 2000) argues that Bay Area NO_x emissions have decreased from 743 to 555 tons/day since 1990, and much of the nitrogen in annual grasslands is lost due to leaching and as ammonia gas as plants die and decay each year, and is not accumulated. This indicates that nitrogen deposition alone is not sufficient to cause the observed increase in non-native grasses, confirmed by the fact that several serpentine sites in Coyote Ridge did not experience grass invasion following cessation of grazing, despite similar nitrogen deposition rates (Boursier *cited in* Coyote Valley Research Park DEIR 2000). The period of grass expansion in the Coyote Ridge sites was one of exceptionally high rainfall, which may have facilitated the grass invasions. Water supplementation has been shown to favor non-native species in previous grassland studies (Milchunas and Laurenroth 1995; Hobbs and Mooney 1991).

In addition, Kruckeberg (1984) identifies a class of ubiquitous species that show relative indifference to serpentine and non-serpentine soils. These include some introduced European annuals such as the bromes (*Bromus mollis*, *Bromus rubens*), wild oats (*Avena fatua*), yellow star-thistle (*Centaurea solstitialis*), and prickly lettuce (*Lactuca serriola*). Introduced weeds generally require some disturbance such as a road cut, gopher activity, or grazing to become established, but once established can tolerate the adverse conditions. Therefore, it is possible that the observed invasion by non-native grasses occurred independently of the effect of nitrogen deposition, facilitated by perturbations such as grazing and increased rainfall.

Nitrogen Deposition Rates

Operation of the combined-cycle natural gas-fired combustion turbines will result in discharge of exhaust gases into the atmosphere through the project's exhaust stacks. Emissions of criteria pollutants from the exhaust stacks will include NOx, sulfur oxides (SOx), and particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}). In addition, emissions of ammonia (NH_3) will occur as a byproduct of the Selective Catalytic Reduction (SCR) technology used to limit emissions of NOx.

None of the resultant concentrations will be at levels that will produce direct adverse effects on the physical aspects or physiological function of vegetation or soils in the area. However, it has been hypothesized that nitrogen deposition on serpentine soils could result in an adverse cumulative impact on the serpentine plant communities' endemic species in the area. The potential for impacts from nitrogen deposition on serpentine soils and the associated plant and animal resources that they support depends on the following:

- Nitrogen deposition rates
- Response of non-native species to nitrogen fertilization

Chemical Transformation of NOx Emissions

The oxidation of nitrogen oxides is a complicated process that can include a large variety of nitrogen species, such as nitrogen dioxide (NO_2), nitric acid (HNO_3) and organic nitrates (RNO_3) such as peroxyacetylnitrate (PAN). Atmospheric chemical reactions that occur in sunlight result in the formation of ozone and other compounds. Depending on atmospheric conditions, these reactions can start to occur within several hundred meters of the original NOx source, or after the pollutants have been carried tens of kilometers downwind. Ultimately, some nitrogen oxides are converted to nitric acid vapor or particulate nitrates. Precipitation is one mechanism that removes these pollutants from the air. Forms of atmospherically derived nitrogen are removed from the atmosphere by both wet deposition (rain) or dry deposition (direct uptake by vegetation and surfaces).

Ammonia and ammonium are other forms in which nitrogen occurs. Ammonia is a gas that becomes ammonium when dissolved in water, or when present in soils or airborne particles. Unlike NOx, which forms during combustion, soil microorganisms naturally form ammonia and ammonium compounds of nitrogen and hydrogen.

In urban atmospheres, the oxidation rate of NOx to HNO_3 is estimated to be approximately 20 percent per hour, with a range of 10 to 30 percent per hour (CARB 1986). Aerosol nitrates (NO_3) are present, mainly in the form of ammonium nitrate (NH_4NO_3). Nitrate and ammonium (NH_4) are the predominant forms by which plants absorb nitrogen. In California, ammonium nitrate is the predominant airborne nitrate-bearing particle in the atmosphere (CARB 1986).

Modeling Assumptions

The computer air dispersion model called the Industrial Source Complex Short Term model, Version 3 (ISCST3) will be used in this deposition analysis. ISCST3 is a steady-state, mass-conserving, nonreactive (i.e., no chemistry) Gaussian plume dispersion model. All turbines will be modeled to assess nitrogen impacts. In addition, NO_x emission controls will be added to the existing turbine in order to reduce existing facility emissions from present baseline. As such, the existing turbine emissions, prior to the addition of controls, will be modeled to establish baseline.

To produce conservative results (overestimate the impacts), modeling assumptions regarding the complex chemistry that occurs to produce nitrogen from NO_x, ammonia, and other pollutants will be used in this analysis. For example, it will be assumed that the pollutants leaving the stack(s) will already be in the form of depositional nitrogen (nitrate and ammonium ions). Thus, all impacts will represent 100 percent conversion of combustion emissions into depositional nitrogen. This assumption leads to an exceedingly conservative estimation of nitrogen deposition, because areas with the highest nitrogen emissions do not necessarily experience the greatest deposition effects, which usually occur far from the original nitrogen source. In addition, since mass is conserved in the model, all downwind calculations of nitrogen deposition, regardless of distance and formation rates, are overestimated by the model.

The ISCST3 model calculates atmospheric deposition of nitrogen by calculating the wet and dry fluxes of total nitrogen. This deposition is accomplished by using a resistance model for the dry deposition part, and by assigning scavenging coefficients for the wet removal process from rainout. As discussed below, depositional parameters are input into the model in order to calculate the deposition of nitrogen. Again, depositional parameters were based on HNO_3, which is consistent with the conservative modeling assumptions that overestimate the amounts of nitrogen deposition from the proposed project. Nitric acid tends to deposit more readily than most other compounds.

Nitrogen Deposition Mechanisms

The ISCST3 wet and dry deposition modeling for gaseous pollutants is based on the algorithm contained in the CALPUFF dispersion model (USEPA 1995), which Moore et al. reviewed and evaluated (1995). The deposition flux, F_d, is calculated as the product of the concentration, χ_d, and a deposition velocity, v_d, computed at a reference height z_d:

$$F_d = \chi_d \bullet v_d$$

The dry deposition algorithm is based on an approach that expresses the deposition velocity as the inverse sum of total resistance. The resistance represents the opposition to transporting the pollutant through the

atmosphere to the surface. ISCST3 incorporates several resistance models that include aerodynamic resistance, canopy resistance, cuticle resistance, deposition layer resistance, mesophyll resistance, and stomatal action.

With wet deposition, gaseous pollutants are scavenged by dissolution into cloud droplets and precipitation. A scavenging ratio approach will be used to model the deposition of gases through wet removal. In this approach, the flux of material to the surface through wet deposition (Fw) is the product of a scavenging ratio times the concentration, integrated in the vertical direction. Since the precipitation is assumed to initiate above the plume height, a wet deposition flux is calculated, even if the plume height exceeds the mixing height.

Model Inputs

In order to model gaseous deposition, the following inputs are required:

- The molecular diffusivity for the pollutant being modeled [cubic centimeters per second (cm^3/s)]
- The solubility enhancement factor (a*) for the pollutant
- The pollutant reactivity parameter
- The mesophyll resistance term (rm) for the pollutant (s/cm)
- The Henry's Law coefficient for the parameter

For this analysis, it will be assumed that the deposition parameters will be based on gaseous nitric acid. Nitric acid will be chosen to represent total nitrogen deposition since nitric acid has the greatest potential for depositional effects. The deposition parameters will be obtained from the CALPUFF modeling system.

The analysis will focus on both land and water deposition rates. The Alphas and Henry parameters are only used when applying the algorithm over a water surface. If no water surfaces were present in a particular application, then dummy (non-zero) values will be input for Alphas and Henry.

In addition to the above inputs, the dry and wet deposition algorithm also requires surface roughness length (cm), friction velocity (meters per second), Monin-Obukhov length (meters), leaf index ratio, precipitation type, and precipitation rate. Site-specific meteorology will be used in this analysis and will be based on the 1993 data set collected at San Jose International Airport.

Many different vegetative land use types surround the project site, predominately rangeland and agricultural. Most of the serpentine areas are in rangeland (on hillsides), so land use characteristics will be defined to model deposition, including the surface roughness length, leaf-area index, and plant-growth state. For roughness lengths, domain-averaged values for agricultural land and rangeland for both an active growing season and an inactive season will be identified. Leaf area indices will also be based on domain-averaged values for an active growing season and an inactive/dormant season. To calculate nitrogen deposition velocities, the state of the vegetation must also be specified and will be based on two primary seasons (growing and inactive/dormant).

This approach will be used to develop conservative, worst-case scenarios to evaluate potential nitrogen deposition on the serpentine habitats (rangeland). The following two scenarios will be used in the assessment of nitrogen depositional fluxes:

Scenario 1: Rangeland—Active Growing Season

- Period: November 1 through June 30
- Vegetation state: active and stressed (nonirrigated)
- Roughness length = 0.05 meter
- Leaf area index = 0.5

Scenario 2: Rangeland—Inactive Season

- Period: July 1 through October 31
- Vegetation state: inactive
- Roughness length = 0.05 meter
- Leaf area index = 0.2

In addition to these scenarios, depositional parameters based on HNO_3 will be used in ISCST3:

- Molecular diffusivity (cm2/sec) = 0.1628
- Alpha star = 1.0
- Reactivity parameter = 18.0
- Mesophyll resistance (seconds per centimeter) = 0.0
- Henry`s law coefficient = 0.0
- Scavenging coefficient [LIQ] 1/(s-mm/hr) = 0.60E-04
- Scavenging coefficient [ICE] 1/(s-mm/hr) = 0.00E+00

Nitrogen deposition must be converted to plant-available forms of nitrogen to affect plant nutrition. Absorption of NO_3 and NH_3 by plant roots is the predominant mode of plant nitrogen nutrition, but a relatively small amount of NH_3 and NO_2 can be absorbed by plant foliage (Marschner 1995).

Plant response to additions of nitrogen fertilization depends not only on the total amount of nitrogen available, but also on the distribution of total supply over time. When added to soil, inorganic forms of nitrogen (mainly NH_4-N and NO_3-N) can be stored, transformed, or removed. Soil processes that reduce the amount of inorganic nitrogen available for plant use include:

- Immobilization of inorganic NH_3 and NO_3 into organic forms occurs through microbial use and plant uptake, and mineralization of organic matter. A portion of the NH_4 and NO_3 is taken up by plants and immobilized into organic forms. In natural soil-plant systems, most of the total nitrogen is in the organic form (in plants and microorganisms). Some of the nitrogen in the soil-plant system can be removed by grazing animals or through harvesting and removing vegetation. As organic matter mineralizes, amino acids decompose to NH_4.
- Gaseous loss of nitrogen occurs through NH_3 volatilization.
- Ammonium can eventually be converted to NO_3 by the microbial process of nitrification in the soils.
- Leaching of NO_3 occurs below the root zone of plants.
- Denitrification of NO_3 and gaseous loss of elemental nitrogen (N_2) and NO_x occurs.

- As a result of the processes, not all of the nitrogen added to the soil during each deposition event is available for plant use.

The maximum potential nitrogen deposition rates that have been estimated for serpentine areas are small compared to the nutritional nitrogen requirement of non-native grasses. Therefore, in areas where ambient nitrogen depositions rates are well below the threshold for adverse impacts on serpentine community (3 to 10 kg N/ha-yr) (USDA 1992), the potential for deposition from the PPP operation to initiate transformation of serpentine habitat is very low. Background nitrogen deposition rates in the South Bay Area are estimated to be approximately 7 kg/ha-yr (Blanchard et al. 1996) and 12 to 15 kg/ha-yr (Weiss 1999). Since these estimates indicate that current deposition rates probably are above the 3- to 10-kg/ha-yr threshold, conditions for impacts on serpentine communities in these areas most likely already exist, so the potential incremental impact of the proposed operation is insignificant given the small average increase (0.0368 kg/ha-yr) in depositional species.

Modeling of the PPP's potential nitrogen deposition effects on critical Bay checkerspot butterfly habitat will be undertaken to determine the acreage of mitigation land offered to offset any potential effects.

8.2.4 Proposed Mitigation Measures

The following will ensure that any potentially significant project environmental impacts to biological resources will be mitigated below the threshold of significance.

The Applicant will participate in the reduction of cumulative, indirect effects of potential nitrogen deposition on the Bay checkerspot butterfly and other state and federally listed serpentine endemic species. To do so, the Applicant will purchase or lease critical Bay checkerspot butterfly and serpentine endemic habitat; retire, reduce, or retrofit existing sources of nitrogen upwind of critical Bay checkerspot butterfly habitat; or offer some combination of these two methods. The extent of emission reductions, habitat purchase, or a combination of the two, will be determined by refined modeling of potential nitrogen deposition from the project (see discussion above).

If appropriate, a management plan will be developed and submitted to the affected regulatory agencies which details the conservation actions to be taken for any critical habitat areas purchased or leased and proposed for mitigation. These actions may include grazing management, fencing, vegetation monitoring, and Bay checkerspot butterfly monitoring. An adaptive management plan would be implemented, which would use the monitoring results to refine the grazing management. The project owner would also provide for management of the mitigation habitat.

8.2.5 Applicable Laws, Ordinances, Regulations, and Standards

Table 8.2-5 (following page) describes the applicable laws, ordinances, regulations, and standards (LORS) pertaining to biological resources for the PPP project.

8.2.6 Involved Agencies and Agency Contacts

There are a number of agencies that are involved with biological resources and special status species. The agencies and persons to contact for each of these agencies are shown in Table 8.2-6.

Table 8.2-6. Agency contacts.

Agency	Contact	Title	Telephone
U.S. Fish and Wildlife Service Federal Building 2800 Cottage Way, Room W-2605 Sacramento, California 95825	Dan Buford Cecilia Brown	Branch Chief, Bay and Delta Branch Biologist	(916) 414-6600 (916) 414-6625
California Department of Fish and Game 7329 Silverado Trail Napa , CA 94558 Mail: P.O. Box 47, Yountville, CA 94599	Carl Wilcox	Wildlife Biologist	(707) 944-5500

8.2.7 Permits Required and Schedule

The Pico Power Project will not result in adverse impacts to any federal or state listed or threatened species. However, as discussed in this section of the AFC, USFWS has indicated a concern relating to nitrate deposition within serpentine soil areas that support habitat for the Bay checkerspot butterfly. The Pico Power Project has provided a mitigation strategy to address any potential cumulative impact associated with regional nitrate deposition. However, this potential cumulative impact does not require any federal or state biological resource-related permit or authorization under federal or state law. Although the Pico Project will continue to work with USFWS, no federal permit is required and any consultation initiated by the Pico Power Project under the Endangered Species Act would be voluntary. Therefore, no schedule is provided.

Table 8.2-5. Laws, ordinances, regulations, and standards.

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Federal					
Endangered Species Act of 1973 and implementing regulations, Title 16 United States Code (USC) §1531 et seq. (16 USC 1531 et seq.), Title 50 Code of Federal Regulations (CFR) §17.1 et seq. (50 CFR 17.1 et seq.).	Designates and protects federally threatened and endangered plants and animals and their critical habitat.	USFWS and NMFS	Issues letter of concurrence after review of mitigation measures. Issues Biological Opinion (BO) with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Formal consultation may be required, BO or letter of concurrence will be obtained prior to construction.	Figure 8.2-1 8.2.1.2 8.2.1.4 Table 8.2-1 8.2.2.2 8.2.5.2
Section 7 of Fish and Wildlife Coordinating Act, 16 USC 742 et seq., 16 USC 1531 et seq., and 50 CFR 17.	Requires consultation if any project facilities could jeopardize the continued existence of an endangered species. Applicability depends on federal jurisdiction over some aspect of the project.	USFWS	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Formal consultation may be required, BO or letter of concurrence will be obtained prior to construction.	8.2.1.4 8.2.5.2
Section 10(1)(A) of the ESA	Requires a permit to "take" threatened or endangered species during lawful project activities. If no federal nexus for project, a Habitat Conservation Plan (HCP) may be necessary.	USFWS	USFWS issues a Section 10(1)(A) Federal Fish and Wildlife Permit and/or HCP approval.	N/A	8.2.2.1 8.2.5.2

Table 8.2-5. (continued.)

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Section 404 of Clean Water Act of 1977 (33 USC 1251 et seq., 33 CFR §§320 and 323).	Gives the USACE authority to regulate discharges of dredge or fill material into waters of the United States, including wetlands.	USACE	USACE issues a nationwide or individual permit to fill wetlands or waters of the United States.	N/A	8.2.2.1 8.2.2.2 8.2.3.1 8.2.5.2
Section 401 of Clean Water Act of 1977.	Requires the applicant to conduct water quality impact analysis for the project when using 404 permits and for discharges to waterways.	CRWQCB	Water Quality Certification	Water quality analysis currently being conducted, Certification to be obtained before construction begins in 2002.	8.2.3.1 8.2.5.2
Migratory Bird Treaty Act 16 USC §§703-711.	Prohibits the non-permitted take of migratory birds.	USFWS and CDFG	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	8.2.1.2 8.2.2.2 8.2.2.3 8.2.2.4 8.2.3.3 8.2.5.2
State					
California Endangered Species Act of 1984, Fish and Game Code, §2050 through §2098.	Protects California's endangered and threatened species.	CDFG	Issues letter of concurrence after review of mitigation measures.	Applicant currently engaged in informal consultation with CDFG. Letter of concurrence will be obtained prior to construction.	Figure 8.2-1 8.2.1.2 8.2.1.4 8.2.2.2 8.2.5.2

Table 8.2-5. (continued.)

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Title 14, California Code of Regulations (CCR) §§670.2 and 670.5.	Lists plants and animals of California declared to be threatened or endangered.	CDFG	Issues letter of concurrence after review of mitigation measures.	Applicant currently engaged in informal consultation with CDFG. Letter of concurrence will be obtained prior to construction.	8.2.1.4 Table 8.2-1
Fish and Game Code Fully Protected Species. §3511: Fully Protected birds §4700: Fully Protected mammals §5050: Fully Protected reptiles and amphibians §5515: Fully Protected fishes	Prohibits the taking of listed plants and animals that are Fully Protected in California.	CDFG	Issues letter of concurrence after review of mitigation measures.	Applicant currently engaged in informal consultation with CDFG. Letter of concurrence will be obtained prior to construction.	Figure 8.2-1 8.2.1.2 8.2.1.4 8.2.2.2 8.2.5.2
Fish and Game Code §1930, Significant Natural Areas.	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitats. Listed in the CNDDB.	CDFG	Issues letter of concurrence after review of mitigation measures.	Applicant currently engaged in informal consultation with CDFG. Letter of concurrence will be obtained prior to construction.	8.2.1 Figure 8.2-1 8.2.1.1 8.2.1.2 8.2.1.4 Figure 8.2-2 8.2.2.2 8.2.2.3

Table 8.2-5. (continued.)

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Fish and Game Code §1580, Designated Ecological Reserves.	The CDFG commission designates land and water areas as significant wildlife habitats to be preserved in natural condition for the general public to observe and study.	CDFG	Issues letter of concurrence after review of mitigation measures.	Applicant currently engaged in informal consultation with CDFG. Letter of concurrence will be obtained prior to construction.	Figure 8.2-1 8.2.2.3
Fish and Game Code §1600, Streambed Alteration Agreement.	Reviews projects for impacts on waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances.	CDFG	Issues conditions of the Streambed Alteration Agreement that reduces and minimizes effects on vegetation and wildlife.	Streambed Alteration Agreement needed only if project impacts banks of waterways during construction.	8.2.2.3
Native Plant Protection Act of 1977, Fish and Game Code, §1900 et seq.	Designates state rare and endangered plants and provides specific protection measures for identified populations.	CDFG	Reviews mitigation options if there will be significant project effects on threatened or endangered plant species.	Mitigation measures being prepared for review by agencies. Letter of concurrence to be obtained before construction.	Figure 8.2-1 8.2.1.4 8.2.2.3 8.2.3.2
CDFG Policies and Guidelines, Wetlands Resources Policy.	Provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools.	CDFG California Environmental Protection Agency (Cal/EPA) CRWQCB	Reviews 404 permit application and wetland mitigation measures for compliance.	N/A	8.2.2.2 8.2.5.2

Table 8.2-5. (continued.)

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Public Resource Code §§25500 & 25527.	Siting of facilities in certain areas of critical concern for biological resources, such as ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value, is prohibited, or when no alternative, strict criteria is applied.	USFWS CDFG	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Section 7 may be required, BO or letter of concurrence will be obtained prior to construction.	8.2.1.2 8.2.2.3 8.2.3.2
Title 20 CCR §§1702 (q) and (v).	Protects "areas of critical concern" and "species of special concern" identified by local, state, or federal resource agencies within the project area, including the CNPS.	USFWS CDFG	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Section 7 may be required, BO or letter of concurrence will be obtained prior to construction.	Figure 8.2-1 8.2.1.2 8.2.1.4 Table 8.2-1 8.2.3.1 8.2.5
Title 14 CCR Section 15000 et seq.	Describes the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site.	USFWS CDFG	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Section 7 may be required, BO or letter of concurrence will be obtained prior to construction.	8.2.2.1 8.2.2.3 8.2.5

8.2.8 References

Barbour, M.G., and J. Major. 1988. *Terrestrial vegetation of California.* California Native Plant Society Special Publication No. 9. 1020 pp.

Blanchard, C.L., H. Michaels, and S. Tannenbaum. 1996. Regional estimates for acid deposition fluxes in California for 1985-1994. California Air Resources Board, Sacramento.

California Air Resources Board (CARB). 1986. The Effects of Oxides of Nitrogen on California Air Quality. Technical Support Division State of California Air Resources Board. Report Number TSD-85-01. March 1986.

California Department of Fish and Game (CDFG). 1984. *Guidelines for assessing the effects of proposed developments on rare and endangered plants and plant communities*.

———1995. Staff report on burrowing owl mitigation. September 1995.

California Energy Commission (CEC). 2001. Staff Assessment, Los Esteros Critical Energy Facility (01-AFC-12), Santa Clara County. December 2001.

California Native Plant Society (CNPS). 1991. Mitigation guidelines regarding impacts to rare, threatened or endangered plants. *California Native Plant Society,* February 1991.

California Natural Diversity Data Base (CNDDB). 2002. California Natural Diversity Data Base—Rarefind. April, 2002.

Coyote Valley Research Park. 2000. Draft Environmental Impact Report, San Jose, CA, pp. 4-458-464.

Dukes, J.S. and Mooney, H.A. 1999. Does global change increase the success of invaders? *Tree* 14(4):135-139.

Ehrlich, P., D. Dobkin and D. Wheye. 1988. *The birder's handbook.* Simon and Schuster. New York, NY.

Erlich, P.R. and D.D. Murphy. 1987. Conservation lessons from long-term studies of checkerspot butterflies. *Conservation Biology* 1(2):122-131.

Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Technical report Y087-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Hickman, J.C. 1993. *The Jepson manual: Higher plants of California.* University of California Press. University of California.

Hobbs, R.J. and H.A. Mooney. 1991. Effects of rainfall variability and gopher disturbance on serpentine annual grassland dynamics. *Ecology* 72:59-68.

Holland, R.F. 1986. *Preliminary descriptions of the terrestrial natural communities of California.* California Department of Fish and Game, Non-game Heritage Program, Sacramento, CA.

Huenneke, L.F., S.P. Hamburg, R. Koide, H.A. Mooney, and P.M. Vitousek. 1990. Effects of soil resources on plant invasion and community structure in Californian serpentine grassland. *Ecology* 71:478-491.

Kruckeberg, A.R. 1984. *California serpentines: flora, vegetation, geology, soils, and management problems*. University of California Press, Berkeley, CA. 168 pp.

Marschner, H. 1995. *Mineral nutrition of higher plants.* Academic press. New York, NY.

McLaughlin, J.F., J.J. Hellmann, C.L. Boggs, and P. Erlich. 2002. Climate change hastens population extinctions. *PNAS* 99(9):6070-6074.

Milchunas, D.G. and W.K. Laurenroth. 1995. Inertia in plant community structure: state changes after cessation of nutrient enrichment stress. *Ecological Applications* 5: 452-458.

Moore, G., P. Ryan, D. Schwede, and D. Strimaitis. 1995. Model performance evaluation of gaseous dry deposition algorithms. Paper 95-TA34.02, 88th Annual Meeting & Exhibition of the Air and Waste Management Association. San Antonio, Texas. June 18-23, 1995.

Peterson, R.T. 1990. *A field guide to western birds.* Houghton Mifflin Company. Boston, MA.

Sawyer, J. and T. Keeler-Wolf. 1995. *A manual of California vegetation.* California Native Plant Society publication.

SCS Engineers. 2002. Phase I Environmental Assessment Report. Duane Avenue at Lafayette Street, Santa Clara, California 95050. File No. 01202038.00.

Tibor, D.P., ed. 2001. *Inventory of rare and endangered vascular plants of California*. California Native Plant Society Special Publication Number 1 (Sixth Edition). Sacramento, CA.

Udvardy, M. 1977. *The Audubon Society field guide to North American mammals*. Alfred Knopf. New York, NY.

U.S. Army Corps of Engineers. 1987. Wetlands Delineation Manual.

U.S. Environmental Protection Agency (USEPA). 1995. A Users Guide for the CALPUFF Dispersion Model. EPA-454/B-95-006. U.S. Environmental Protection Agency, Research Triangle Park, NC.

U.S. Fish and Wildlife Service (USFWS). 1998. Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area. Sacramento, CA.

Wedin, D.A. and D. Tillman. 1996. Influence of nitrogen loading and species composition on the carbon balance of grasslands. *Science* 274:1720-1723.

Weiss, S.B. 1999. Cars, cows, and checkerspot butterflies: Nitrogen deposition and management of nutrient-poor grasslands for a threatened species. *Conservation Biology* 13(6):1476-1486.

Zeiner, D. 1988. *California's wildlife, volume I: Amphibians and reptiles.* California Statewide Wildlife Habitat Relationships System.

Zeiner, D. 1990a. *California's wildlife, volume II: Birds*. California Statewide Wildlife Habitat Relationships System.

Zeiner, D. 1990b. *California's wildlife, volume III: Mammals.* California Statewide Wildlife Habitat Relationships System.

Figure 8.2-3. Biological resources within one mile.

Figure 8.2-3 can be found as a separate PDF file in this folder.